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09/364,159

07/30/1999

KOJI SUZUKI

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7590

08/11/2003

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EXAMINER

SCHECHTER, ANDREW M

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 08/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/364,159

Applicant(s)

SUZUKI ET AL.

Examiner

Andrew Schechter

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 6-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10 and 11 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-9 and 12-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 3 June 2003 have been fully considered but they are not persuasive.

The applicants have amended claims 1 and 8 to recite the new limitation "a thickness of said back-surface electrode is such that no substantial protrusion is formed in said display electrode" (or similar).

The applicants argue [p. 5] that neither *Shintani* nor *Hirano* disclose the amended limitation. This is not persuasive. *Hirano* [see Fig. 3] shows a flat back-electrode with no protrusions formed in the display electrode; *Shintani* shows, if anything, an indentation as opposed to a protrusion in the display electrode, and this is not due to the back-surface electrode.

The applicants argue [pp. 5-6] that *Shimada* '832 does not disclose the amended limitation. This is not persuasive. The back-surface electrode in *Shimada* '832 is uniform and flat, and does not form protrusions in the display electrode. There are clearly protrusions in the display electrode, but these are formed by means unrelated to the thickness of the back-surface electrode.

The applicants argue [p. 6] that the "Examiner reasons that, because ITO has a high melting point, forming the back-surface electrode using a high melting point metal is obvious. Applicants respectfully disagree with this reasoning." This misstates the examiner's reasoning and is not persuasive. Contrary to the applicants' assertion, the

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examiner reasoned that the ITO and Mo (molybdenum) are art-recognized equivalents as shown by *Hirano*, so using Mo in place of ITO would be obvious to one of ordinary skill in the art. Mo is a high melting point metal, so the claim limitations are met.

The applicants assert [p. 6] that new claims 13-15 depend from allowable claims. This is incorrect. Claim 13 is a new, independent claim, and is rejected below.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by *Hirano*, U.S. Patent No. 6,292,241.

*Hirano* discloses [see Fig. 3, for example] a reflective type liquid crystal display device comprising a display electrode [E, element 2] made of a reflective material [Al-Nd-Si, an aluminum alloy] with a back-surface electrode [element 12, a Mo layer] disposed in contact with a back surface of the display electrode, and the two patterned into the same shape [see Figs. 3B-C]. A thickness of the back surface electrode layer is such that no substantial protrusion is formed in the display electrode. The method of manufacturing this device, comprising forming the back-surface electrode layer, the

display electrode layer on it, and patterning the two in the same shape is also disclosed, so claim 8 is anticipated.

4. Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by *Shintani et al.*, U.S. Patent No. 5,978,056.

*Shintani* discloses a reflective type LCD with a display electrode [8a] and a back-surface electrode [53] patterned in the same shape and the method of making the above device is also disclosed. The thickness of the back-surface electrode layer is such that no substantial protrusion is formed in the display electrode, so claim 8 is anticipated.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 6, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Shimada et al.*, U.S. Patent No. 5,182,620 in view of *Shimada*, U.S. Patent No. 5,877,832.

*Shimada '620* discloses an LCD comprising a display electrode [4], a TFT with an active layer [12], with the display electrode directly connected to the active layer via a

contact hole. It does not disclose a back-surface electrode on the back of the display electrode, patterned in the same shape.

*Shimada '832* teaches [see Figs. 8-9] forming a reflective LCD by forming a back-surface electrode [11a] and a reflective electrode [40] on it, patterned in the same shape. It would have been obvious to one of ordinary skill in the art to do so, motivated by *Shimada '832*'s teaching that the two-layered structure "results in efficient reflection of the incident light...the entire picture element area can be used efficiently, thereby improving the numerical aperture" [col. 4, lines 46-50]. The thickness of the back-surface electrode is such that no substantial protrusion is formed in the display electrode. (The examiner takes official notice that making reflection-type LCDs as opposed to transmission-type LCDs is well-known in the art, and would be obvious to one of ordinary skill in the art, motivated by the desire to produce a more light-weight, energy-efficient device – since a backlight and its large power source are not necessary.) Claim 1 is therefore unpatentable.

The active layer in *Shimada '620* is poly-silicon, so claim 6 is also unpatentable. The display electrode in *Shimada '620* (and hence the back-surface electrode in the combination) elongates to a place above a part of the active layer, with the contact hole going from that electrode to the active layer, so claim 12 is also unpatentable.

7. Claims 2, 3, 7, 13, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Shimada '620* in view of *Shimada '832*, as applied to claims 1 and 6 above, and further in view of *Hirano*.

*Shimada* '832 does not disclose that the back-surface electrode is made of a high melting point metal as recited in claims 2 and 7. The back-surface electrode in *Shimada* '832 is made of ITO, which does have a high melting point; however, ITO is a metal oxide rather than a metal. Contrary to the position taken by the examiner in the previous office actions, ITO will not be considered to be a "high melting point metal", reserving this term for purely metallic materials such as W, Mo, Ti, TiN, TiW, Ta, Cr, further alloys of these, etc. Nonetheless, this is not a patentable distinction.

*Shimada* '832 discloses using ITO for the back-surface electrode, but also states that it "may be formed of other types of metal" [col. 11, lines 4-5] without giving examples. The ITO film in *Shimada* '832 serves as a back-surface electrode making good electrical contact to the reflective surface electrode. ITO and Mo are art-recognized equivalents for this purpose, as shown by their interchangeable use in this context in *Hirano* [col. 8, lines 28-30, for example]. One of ordinary skill in the art would therefore find it obvious to use Mo in place of the ITO in the combination device discussed above, so claims 2 and 7 are unpatentable. Mo is a non-oxide metal, and it is recited in the group of claim 15, so claims 14 and 15 are also unpatentable.

*Shimada* '832 discloses that the reflective display electrode is made of aluminum [col. 11, lines 24-29], so claim 3 is also unpatentable.

The new claim 13 recites a subset of features of claim 7, which are met as described above, and the additional feature that there is an insulating film covering the thin film, which is a smoothened film in which there is the contact hole. This additional feature is disclosed by *Shimada* '620 [14 and 17 are a smoothened insulating layer

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through which the contact hole goes]. Claim 13 is therefore unpatentable. [Note: the difference between the allowed method claim 10 and the rejected device claim 13 is that the method claim recites “a step of patterning” which must be a single operation, while in *Shimada* '620 the back-surface electrode and display electrode layers are separately patterned in the same shape.]

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Shintani* as applied to claim 8 above, and further in view of *Ishii et al.*, U.S. Patent No. 5,566,010.

*Shintani* discloses forming a smoothened insulating film with a contact hole, on which the back-surface electrode is formed. *Shintani* discloses a MOSFET transistor in silicon, as opposed to a “thin-film transistor”, so it does not anticipate claim 9.

However, a poly-silicon thin film transistor and a MOSFET transistor are art-recognized equivalents for switching devices in these kinds of LCD devices, as shown by *Ishii* [col. 10, lines 10-16]. It would therefore have been obvious to one of ordinary skill in the art to use a poly-silicon TFT in place of *Shintani*'s MOSFET. Claim 9 is therefore unpatentable.

#### ***Allowable Subject Matter***

9. Claims 10 and 11 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter:

*Shimada* '832 does not disclose “a step of patterning” as recited in claim 8;  
*Hirano* does not disclose connecting the back-surface electrode to the TFT via a contact



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hole, the kind of structure disclosed as prior art in Fig. 1 of *Hirano*; and *Shintani* does not disclose a "high melting point metal" as the material of the back-surface electrode. Claim 10 is therefore allowed, as is claim 11 which depends on it.

### **Conclusion**

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and an extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (703) 306-5801. The examiner can normally be reached on Monday - Friday, 9:00 - 5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-4711 for regular communications and (703) 746-4711 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

AS

Andrew Schechter  
July 28, 2003

TOANTON  
PRIMARY EXAMINER